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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,592	09/29/2003	Junji Yamada	242921US2	9972

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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

EXAMINER
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CHU, CHRIS C

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 03/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

**Office Action Summary**

Application No.

10/671,592

Applicant(s)

YAMADA ET AL.

Examiner

Chris C. Chu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 - 6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 4 is/are rejected.
- 7) ☒ Claim(s) 5 and 6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/29/03</u> . | 6) <input type="checkbox"/> Other: ____  |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 1 is objected to because of the following informalities:

In claim 1, line 7, the term “the plate-like semiconductor body” lacks antecedent basis.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamada et al. (U. S. Pat. No. 5,956,231).

Regarding claim 1, Yamada et al. discloses in e.g., Fig. 3, Fig. 15(a) and Fig. 20 a semiconductor power module comprising:

- a metallic base (13; column 11, line 33);
- an insulating substrate (201 and 202a) fixedly laminated on the metallic base, the insulating substrate including a plate-like insulating body (201; column 12, line 1) and a surface conductive layer (202a) fixedly laminated on a surface of the plate-like semiconductor body (201; For the examination purpose, examiner assumed the term

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“the plate-like semiconductor body” is the plate-like insulating body) via a surface side fixing member (34 and 44; see Fig. 15(a));

- a power semiconductor element (IGBT chip; column 12, line 12) mounted on the insulating substrate; and
- an electrode terminal plate (205; column 12, lines 16 – 19) fixed to the insulating substrate via a joint portion (306; column 12, line 51),
- wherein the surface side fixing member (34 or 304 and 44 in 305; see Fig. 15(a)) includes:
  - a first fixing portion (44; column 15, lines 22 – 27) for fixing one part of the surface conductive layer located underneath the joint portion of the electrode terminal (205); and
  - a second fixing portion (34; column 12, lines 59 – 60) for fixing the other part of the surface conductive layer which is not located underneath the joint portion, and
- wherein a fixing strength exhibited by the first fixing portion is smaller than that exhibited by the second fixing portion (since first fixing portion, the element 44, is silicone gel or oil and the second fixing portion, 34, is bonding material made of silver as similar as applicant's material, Yamada et al. meets this limitation).

Regarding claim 3, Yamada et al. discloses in e.g., Fig. 15(a) a boundary portion between the first fixing portion and the second fixing portion is tightly sealed.

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4. Claims 1 – 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Komorita et al. (U. S. Pat. No. 5,328,751).

Regarding claim 1, Komorita et al. discloses in e.g., Fig. 25 a semiconductor power module comprising:

- a metallic base (407; column 24, lines 57 – 58);
- an insulating substrate (408; column 25, line 15) fixedly laminated on the metallic base, the insulating substrate including a plate-like insulating body (401; column 25, line 34) and a surface conductive layer (402; column 25, line 52) fixedly laminated on a surface of the plate-like semiconductor body (401; For the examination purpose, examiner assumed the term “the plate-like semiconductor body” is the plate-like insulating body) via a surface side fixing member (403; column 23, lines 19 – 30 and column 26, line 32);
- a power semiconductor element (409; column 25, lines 13 – 14) mounted on the insulating substrate; and
- an electrode terminal plate (411; column 25, line 16) fixed to the insulating substrate via a joint portion (412; column 25, line 30),
- wherein the surface side fixing member (403) includes:
  - a first fixing portion (405; column 25, line 18) for fixing one part of the surface conductive layer located underneath the joint portion of the electrode terminal (411); and

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- a second fixing portion (404; column 25, lines 13 – 16) for fixing the other part of the surface conductive layer which is not located underneath the joint portion, and
- wherein a fixing strength exhibited by the first fixing portion is smaller than that exhibited by the second fixing portion (the total area of the first fixing portion is much smaller than the second fixing portion, thus, the first fixing portion 405's fixing strength is smaller than the second fixing portion's strength. Thus, Komorita et al. meets this limitation).

Regarding claim 2, Komorita et al. discloses in e.g., Fig. 25 the first fixing portion (405) being formed by providing a fixing member only on its peripheral portions while its central portion (406; column 25, line 20) is formed as an unfixed clearance portion.

Regarding claims 3 and 4, Komorita et al. discloses in e.g., Fig. 25 a boundary portion (any boundary or edge portions of the element 404 and 405) between the first fixing portion and the second fixing portion being tightly sealed.

#### *Allowable Subject Matter*

5. Claims 5 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

(A) Claim 5 contains allowable subject matter because none of references of record teach or suggest, either singularly or in combination, at least the limitation of a first fixing portion being quadrangular having four peripheral portions, and one of the four

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peripheral portions located at a boundary portion with respect to the second fixing portion not provided with a fixing member but only the remaining three peripheral portions are provided with the fixing member while central portion is formed as an unfixed clearance portion.

(B) Claim 6 is a dependent claim of objected claim (claim 5), this claim is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### *Conclusion*

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Neidig et al., Mizunoya et al., Shinohara et al., Tsunoda, Oshima et al., Nishiura et al., Yoshida and Usui et al. disclose a power semiconductor device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is 571-272-1724. The examiner can normally be reached on 11:30 - 8:00.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 517-272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chris C. Chu  
Examiner  
Art Unit 2815

C.C.  
Monday, February 28, 2005

  
GEORGE ECKERT  
PRIMARY EXAMINER